Asphyxiation of Welder on LNG Construction Site

23 August, 2009

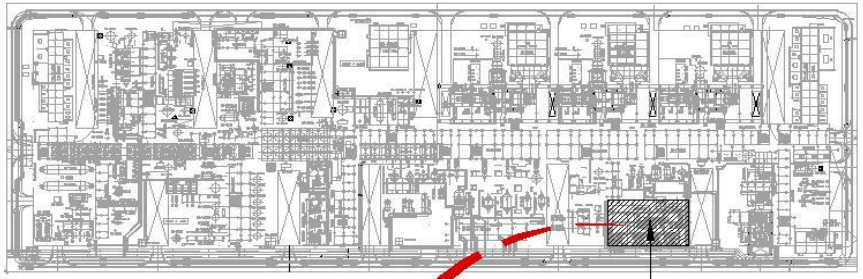
Statement

- **Who:** Mr. Harendra, Welder
- **What:** Found unconscious inside a 24” stainless steel pipe. Attempts to revive were unsuccessful.
- **Where:** Train 7 53-XH0603
- **When:** 09:30 August 23, 2009

Sequence of Events

- Welding crew conducted Toolbox Talk and Task Instruction Meetings.
- Two welders assigned to Joint #29
- Two welders & one helper prepared equipment
- Argon dam installed during fit up on Aug. 20
- Welders decided one work on Joint #29 24” and other work on Joint #98 16”
- Welder began Root & Hot pass welds on Joint #29
- Completed welds and called down to helper on lower level “You come up, I go In”.
- Helper went up to work level, took approx. 2-3 minutes
- Welder was inside 24” pipe. Helper called to him with no response
- Helper called for help from welders in adjacent area. They attempted to call with no response
- Helper went to Foreman on ground level to make notification
- Emergency services notified and responded
- Victim retrieved from pipe unconscious/unresponsive
- CPR attempted but unsuccessful.

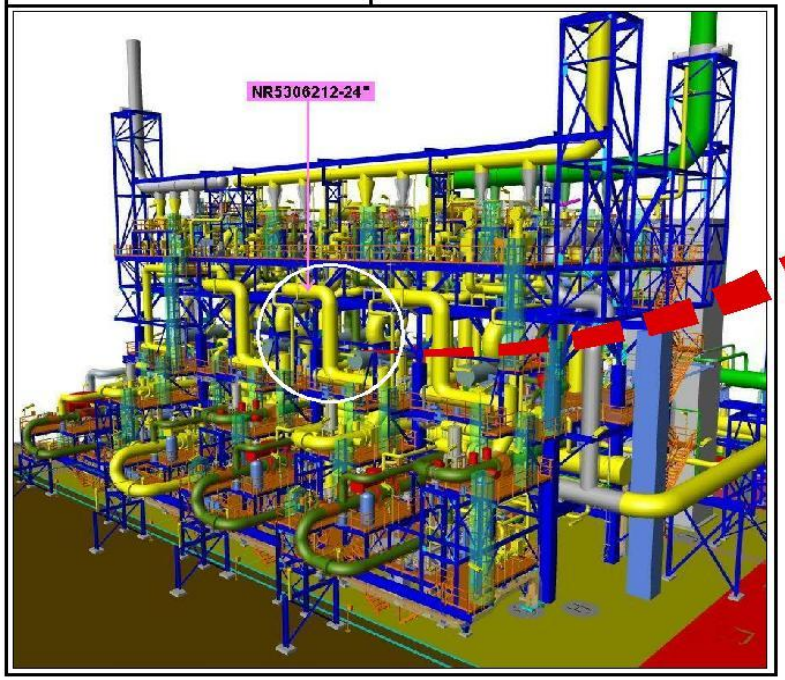
TRAIN - 7 KEY PLAN

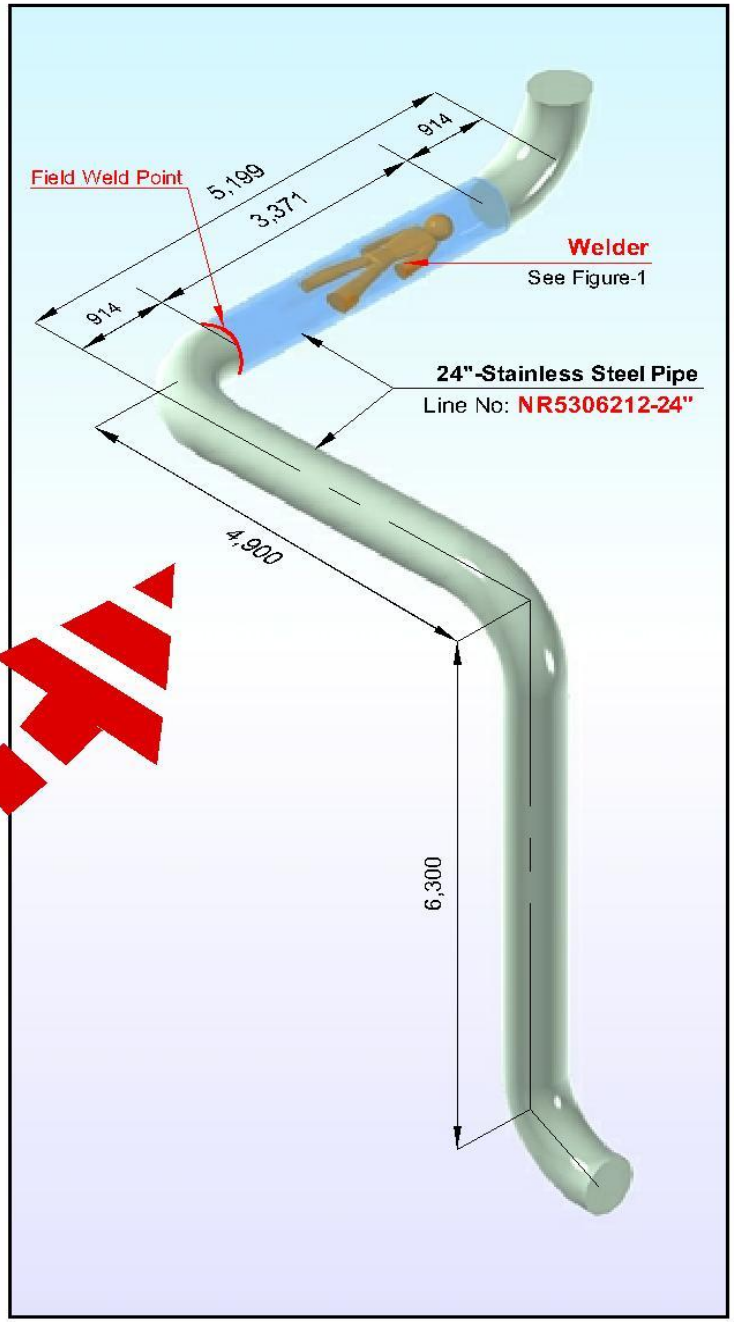


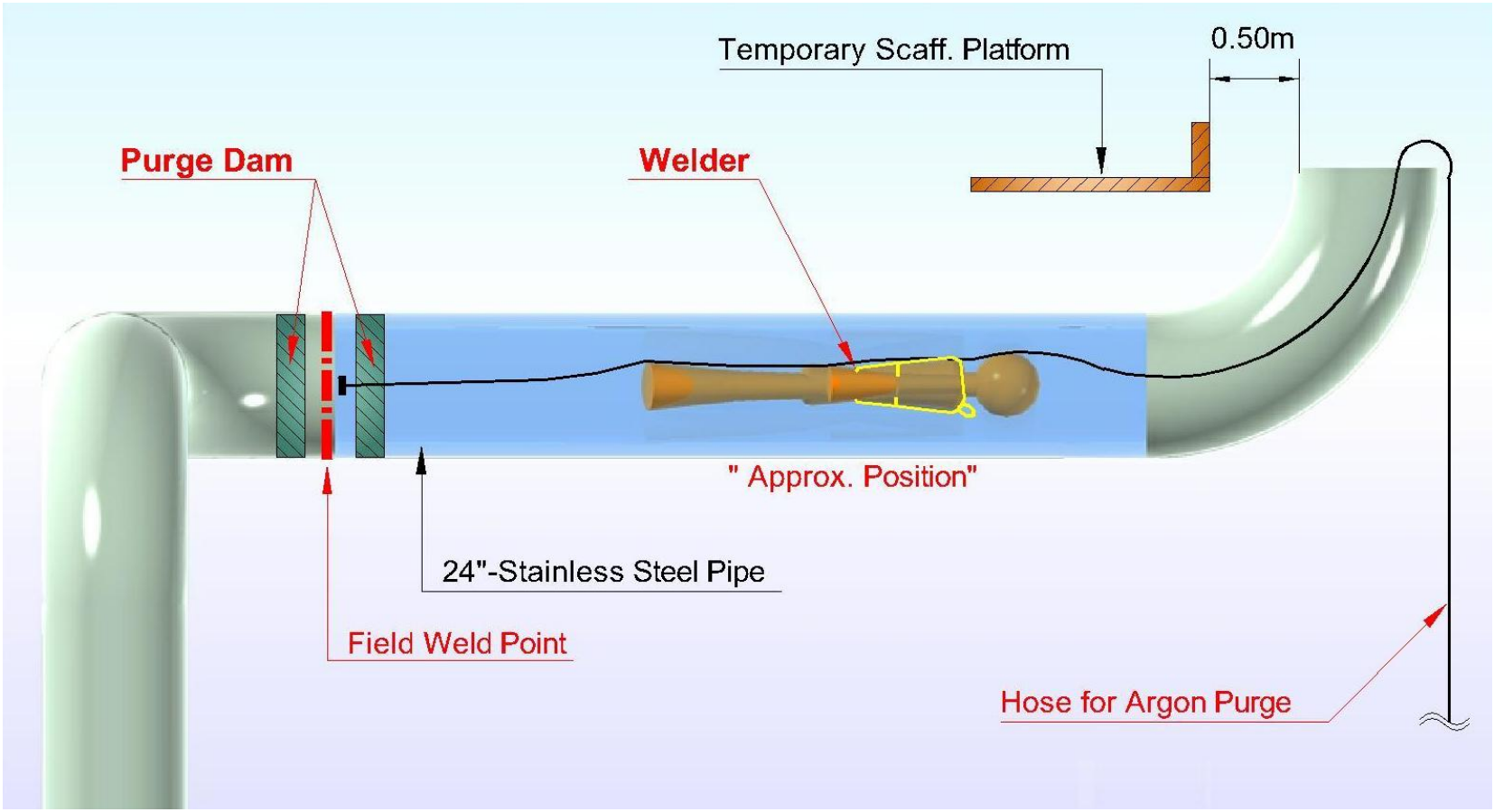
LOCATION OF INCIDENT

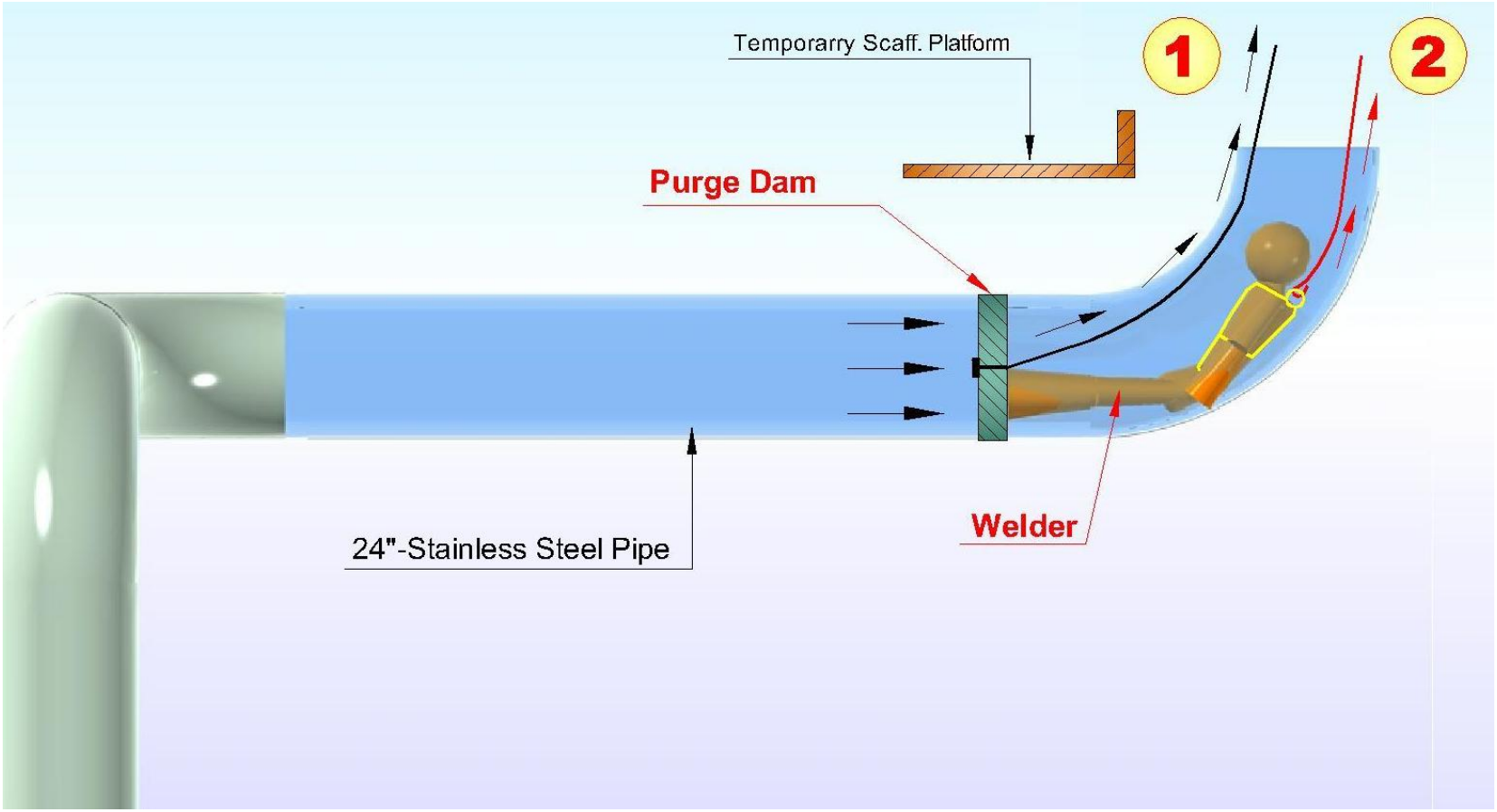
53-XH0603 @ 20m Level

53-XH0603






Temporary Scaff. Platform
0.50m
Purge Dam
Welder
" Approx. Position"
24"-Stainless Steel Pipe
Field Weld Point
Hose for Argon Purge


Temporarry Scaff. Platform
1
2
Purge Dam
24"-Stainless Steel Pipe
Welder

Purge Dams

for Argon Purging


Welding area where the welder would have been working before inside - spool length 3.5 meters
X

Re-Creation

Victim’s last known position

Re-Creation

Position of helper when last saw Victim

Findings

- No evidence that the victim intended harm to himself
- No evidence that the victim fell into the pipe
- Evidence indicates the victim entered pipe on his own to inspect his weld
- No tools in possession other than cell phone (light)
- Re-creation indicated person of similar size can move relatively easily inside 24” (ID 22”) pipe
- Two welders assigned to the task but separated without direction from supervision

Re-Creation

Findings (cont.)

- No Confined Space Entry was required to complete this job. (External welding only)
- 10.2% Oxygen measured approx. 20 minutes after entry by the victim
- Awareness around inert gases needs improvement
- Other welders interviewed indicated they “might” go into a pipe to check weld
- Similar incidents have occurred at other locations within the industry
- The victim had excellent history as a welder and employee

Findings (cont.)

- ISO indicated line 100% radiography
- Weld passed Radiography
- No Method Statement/JSA that would apply to this task.
- No record of confined space or argon/inert gas training for the victim
- HSE Training Matrix inconsistencies between contractors
- 9 Welders & 5 helpers assigned to one Charge Hand
- Only Helper had Confined Space Training

Causal Factors & Root Causes

Entered 24” oxygen deficient atmosphere to inspect weld	No Training – Decided not to train based on training matrix. Training based on task.
	“Labels” Needs Improvements – No warning/labels on confined spaces
	Enforcement Needs Improvement - Compliance with site procedures
	Corrective Action Needs Improvement – Previous external incidents

Causal Factors & Root Causes (Cont.)

No Evidence of Confined Space or Inert Gas training for Welder	Decided Not to Train based on training matrix. Training based on task.
	Communication Not Timely – Training Matrix Update
IP and Welder #2 decide to split up after assignment	Supervision during work needs improvement
Charge Hand had large Span of Control	Administrative Control not used – Not following Resource Control Guidance

Causal Factors & Root Causes (Cont.)

Task Instruction did not include any information about confined spaces or inert/argon gases	Pre-Job Briefing Needs Improvement

Corrective Actions

- Provide awareness training on confined spaces for all field workers
- Provide confined space entrant, attendant, and supervisor training for all welders and pipefitters
- Revise current Safety Induction training to improve C.S. and inert gases hazard awareness
- Provide training to all welders on inert/argon gas hazards.

Corrective Actions (Cont.)

- Post signage and barrier with confined space warning on all pipe opening 16” and greater.
- Add to the Golden Rules list “Entry into a Confined Space without a permit”
- Develop a process to implement “hard actions” based on external incidents. Specifically fatalities

Corrective Actions (Cont.)

- Revise HSE training matrix to require CSE training for all welders
- “Scrutinize” training matrix for gaps
- Improve document control delivery process

Corrective Actions (Cont.)

- Establish a clear rule for worker/supervision ratio and develop guidelines including considerations for geographical spread
- Include in the Sr. Mgmt Walk thru questions about supervisor interaction/visibility with workers.

Corrective Actions (Cont.)

- Revise Pipe Erection Method Statement/JSA to address welding and inert/argon gases
- Create a process to Update Method Statements/JSA with information from external fatality incidents that have application to this work site
- Include in Task Instruction (TI) audits & training material the use of Method Statements/JSA's by supervision to create TI's
- Include in TI audits that TI's are completed at the Task Location.